

REMARKS

Claims 19-26, 29 and 30 are pending in this application. By this Amendment, claims 19 and 22 are amended, claims 29 and 30 are added, and claims 27 and 28 are canceled. Support for the amendments to the claims may be found, for example, in the specification at paragraph [0021] and pages 10-17, Examples 1-6. No new matter is added.

In view of the foregoing amendments and following remarks, reconsideration and allowance of the claims are respectfully requested.

I. Rejection Under 35 U.S.C. §103

The Office Action rejects claims 19-28 under 35 U.S.C. §103(a) over U.S. Patent No. 4,769,073 to Tastu et al. ("Tastu") in view of EP 444470 to Ashley et al. ("Ashley") and further in view of U.S. Patent No. 6,171,572 to Aozasa ("Aozasa") and U.S. Patent No. 5,264,010 to Brancaleoni ("Brancaleoni"). By this Amendment, claims 27 and 28 are canceled, thus the rejection is moot as to those claims. As to the remaining claims, Applicants respectfully traverse the rejection.

Claim 19 recites, *inter alia*, "An abrasive for polishing a rock crystal, a quartz glass for a photomask, a semiconductor device or a hard disk made of glass, the abrasive comprising a sol, which includes particles dispersed in an aqueous medium, wherein: the particles comprise as a main component crystalline cerium oxide of cubic system and as an additional component a lanthanum compound, neodymium compound or a combination thereof ... the abrasive has a pH of 3 to less than 5." Claim 22 recites similar features. The applied references would not have rendered obvious at least the above features of claims 19 and 22.

The Office Action asserts that Tastu discloses an admixture containing cerium oxide and a lanthanide salt that has a pH in a range from 5-10. *See* Office Action, page 2. Tastu does not disclose a pH of from 3 to less than 5. Further, Tastu only mentions a pH of 5 once,

and repeatedly discloses that the pH of the reaction mixture should be greater than 6. *See* Tastu, col. 3, lines 18 and 60; col. 7, lines 36-37; and col. 8, lines 3-5. Furthermore, Tastu discloses that the pH of the reaction medium should be between 7 and 9. *See* Tastu, col. 3, line 6; col. 5, lines 63-64; and col. 8, line 5. Thus, while Tastu may disclose a pH of 5-10, which encompasses nearly half of the pH scale, Tastu does not disclose either a strong acid or a strong base. Rather, Tastu discloses a range of six pH values around neutral, and strongly prefers a neutral to basic pH. Therefore, it would not have been obvious to one of ordinary skill in the art to have modified Tastu to have included a pH from 3 to less than 5, as recited in claims 19 and 22.

The abrasive of claims 19 and 22 improves the polishing properties of the abrasive by having an acidic pH. The improved polishing properties include improved stability, obtaining a good polished surface, and an improved polishing rate. Further, all of the Examples in the specification have an acidic pH and, thus the improved properties of those abrasives would not be realized by the alkaline abrasives disclosed in Tastu. Accordingly, it is submitted that Tastu would not have rendered obvious at least this feature of claims 19 and 22.

In addition, it is maintained that the Office Action improperly applies Tastu and that the admixture with a pH of 5-10 is not even an abrasive solution. The portion of Tastu relied on as allegedly disclosing an abrasive solution having a pH of from 5-10 is a solution used to form ceric oxide and, thus, cannot be the abrasive comprising ceric oxide.

Tastu discloses ceric oxide solutions that can be formed using ceric oxide made from one of three methods. The first method is disclosed in French Patent. No. 2,472,601; the second is disclosed in French Patent. No. 2,549,846; and the third method is disclosed in French Patent No. 2,545,830. *See* Tastu, col. 3, lines 8-20; col. 5, lines 7-15; and col. 7, lines 6-10. These methods all include a solution for forming a ceric oxide that includes a basic solution and has pH of greater than 6 but less than 10. However, each of these disclosures are

methods for producing ceric oxide, and the resultant ceric oxide is then eventually used to form a separate, final glass polishing composition. Please see the corresponding arguments made in the Amendment filed on August 11, 2009, which are incorporated herein in their entirety.

In response to the arguments made in the Amendment filed on August 11, 2009, the Office Action asserts that "Tastu discloses the process of introducing cerium into the reaction medium in the cerous state and is then oxidized to the ceric state and hence controlling the pH of the reaction medium (col. 3, lines 31-64)." Office Action, page 7. This does not address Applicants' assertion. This portion of Tastu describes the reaction medium of French Patent No. 2,472,601 that is used to form ceric oxide that can later be used in the polishing composition of Tastu, but it is not the final polishing composition and, thus, the pH of this reaction medium cannot be attributed to the final polishing composition of Tastu. For example, NaCl is made from a solution having HCl and a very low pH. However, a saline solution made from the resulting NaCl does not have a pH that resembles that of the HCl solution. The same applies here.

The Office Action also asserts that "the chemical composition of cerium based polishing composition that includes cerium oxide is illustrated in Examples 1-8 and claim 17." Office Action, page 7. Example 1 of Tastu discloses:

A ceric oxide suspension was produced from a ceric oxide composition containing 66% ceric oxide. This composition, prepared according to French patent No. 2,472,601, is commercially available under the trademark Cerox 1600.

In particular, the properties of Cerox 1600 are the following:

I. Chemical composition:

- (i) Rare earth oxides: 94%
- (ii) Ceric oxide: 66%
- (iii) Lanthanum oxide: 19%
- (iv) Neodymium oxide: 9%
- (v) Praseodymium oxide: less than 0.0001%.
- (vi) Fluoride expressed in F⁻: 4%

- (vii) Phosphate, expressed as P_2O_5 : 4%
- II. Apparent packed density: $d_A = 1.6 \pm 0.2$
- III. Specific surface: $s.s = 6 \pm 1 \text{ m}^2/\text{g}$
- IV. Mean particle diameter: $d_{50} = 1.5 \pm 1 \mu\text{m}$
- V. Percentage of particles having a diameter larger than 15 μm : 0%

One liter of an aqueous suspension of ceric oxide was prepared, same having the following composition:

- (i) 400 g Cerox 1600;
- (ii) 12 g cerous nitrate $Ce(NO_3)_3 \cdot 6H_2O$;
- (iii) 940 cm^3 deionized water.

Tastu, col. 12, lines 13-37 (emphasis added). As can be seen from Example 1, the ceric oxide composition (glass polishing composition) is produced from a composition comprising 66% ceric oxide formed according to French Patent No. 2,472,601, which is Cerox 1600. The Example goes on to disclose the properties of Cerox 1600, which is formed by, *inter alia*, using a reaction solution with a pH greater than 6 but less than 10. See Tastu, col. 3, lines 59-64. The Example then discloses that the glass polishing solution is formed using 400 g of Cerox 1600 (see the underlined portion above). Thus, the Examples of Tastu disclose that ceric oxide, which is formed according to the methods of three French patents, is added to a solution of cerous nitrate and deionized water to form a glass polishing solution, but a pH of the final glass polishing solution formed from ceric oxide, cerous nitrate and deionized water is not disclosed in Tastu.

The Office Action has not shown any reasoning why a pH of the reaction medium used to form ceric oxide would be present in a separate composition that comprises the formed ceric oxide. Thus, the Office Action has not shown that the applied references expressly or inherently disclose each and every feature of claims 19 and 22.

Further, Tastu does not provide any reason or rationale for one of ordinary skill in the art to have modified its glass polishing composition to have had a pH as recited in claims 19 and 22. In addition, Ashley, Aozasa and Brancaleoni do not address this discrepancy of

Tastu as to claims 19 and 22 and, thus, the applied references would not have rendered obvious at least this feature of claims 19 and 22.

Claims 19 and 22 would not have been rendered obvious by Tastu, Ashley, Aozasa and Brancaleoni, individually or in combination. The remaining claims variously depend from claims 19 and 22 and likewise would not have been rendered obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. New Claims

By this Amendment, new claims 29 and 30 are presented. New claims 29 and 30 depend from claims 19 and 22, respectively, and, thus, distinguish over the applied references for at least the reasons discussed above with respect to claims 19 and 22, as well as for the additional features that they recite. Prompt examination and allowance of new claims 29 and 30 are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Petition for Extension of Time
Request for Continued Examination

Date: March 3, 2010

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